

REMARKS

Claims 1-12 are pending in this Application. Claim 1 is amended to correct an inconsistency per the Examiner's request. Specifically, the word "polyamideimide" is replaced with the term -- polyamide imide -- to concur with the language of claim 3. In addition, the word "polyamideimide" is replaced with the term -- polyamide imide -- in various places within the Specification as specified above in the Amendments To The Specifications. The Examiner is thanked for pointing out this inconsistency.

Rejections Under 35 U.S.C § 103

Independent claim 1 and dependent claims 2-11 were rejected under 35 U.S.C § 103(a). All pending claims have been rejected as being obvious over US Patent No. 5,279,878 to Fottinger et al. ("Fottinger") in view of US Patent No. 4,433,493 to Poisson ("Poisson"). Dependent claim 12 was rejected as being obvious over Fottinger in view of Poisson and further in view of US Patent No. 4,865,906 to Smith, Jr. ("Smith, Jr.").

The cited patents have been fully considered and it is respectfully submitted that they do not prevent patenting of the claims. The Examiner is thanked for a careful review of the claims, including each of the dependent claims, and thoughtful analysis.

Claim 1 recite a fire resistant material comprising a woven faced or warp knitted fabric. As recited, the fabric is composed of fibers selected from meta-aramid, polyamide imide and mixtures thereof. The fabric also includes a woven mesh back with low thermal shrinkage fibers, to provide a two-layer fabric. The low thermal shrinkage fibers form an interwoven backing scrim on the face fabric. Additionally, the ratio of face to back yarns is in the range 6:1 to 12:1.

Fottinger teaches a nonwoven fabric made by bonding graphitized polyacrylonitrile fibers using a water jet needling technique. In some embodiments the nonwoven fabric is provided with reinforcing threads (col 2, lines 62-63) that may consist of aramids or polyamidimide (col 3, lines 11-15). These reinforcing threads are added to provide a fabric that can withstand a higher mechanical stress than the nonwoven fabric alone for applications such as upholstery for furniture. In one embodiment, Fottinger teaches inserting 4 to 24 reinforcing threads per inch

(warp direction) and 4 to 15 reinforcing threads per centimeter (weft direction) (col. 2, lines 63-67).

Claim 1 recites a fabric that includes two layers of different thermal shrinkage properties: a face fabric and a backing scrim. The backing scrim is made from low thermal shrinkage fibers (e.g. polyamide imide). The degree of interlacing between the face and back yarns are chosen so as to provide a fabric with desired fire resistance, thermal shrinkage properties and surface properties appropriate for use in fire fighting clothing, for example. As mentioned previously, this is achieved by using a ratio of face to back yarns in the range of 6:1 to 12:1. Fottinger does not teach or suggest a fabric with such a face to back yarn ratio.

Poisson teaches an open mesh knitted fabric with high tensile strength appropriate for use in conveyer belts. As shown in Figure 2 of Poisson, the fabric is composed of warpwise parallel chains 26, 28, 30, each chain composed of three braided chain stitch yarns (e.g. 20, 22, 24). The warpwise chains are interlaced with weftwise yarns 34. In some embodiments, the chain stitch yarns and weftwise yarns may consist of high temperature resistant fibers such as "Kevlar" (para-aramid fibers) or "Nomex." Poisson, however, does not teach or suggest interlacing of fibers or yarns with different thermal shrinkage properties. As with Fottinger, Poisson also does not teach or suggest a fabric with face to back yarns in the range of 6:1 to 12:1.

The Examiner acknowledges the shortcomings of Fottinger. However, the Examiner argues that it would be obvious to one having ordinary skill in the art to have used Poisson's para-aramid mesh in place of the nonwoven fabric of Fottinger, motivated by the desire to obtain a flame barrier with increased dimensional stability, tensile strength and tear resistance. Applicants respectfully disagree.

Poisson relates to forming a heavy braided fabric with high tensile strength in a lengthwise direction suitable for use as conveyer belts. Claim 1, on the other hand, recites a fabric that can provide thermal protection of human skin and has physical properties suitable for use in fire protection garments. It is argued, therefore, that a person having ordinary skill in the art of fireproof garments would not have been motivated to look in the art of conveyor belt materials.

Furthermore, even if the Examiner were to combine these cited references, the combination would still not teach the Applicant's invention as claimed. Specifically, if Poisson's para-aramid mesh were to be used in place of the nonwoven fabric of Fottinger, the

resulting fabric would have a different weave than the present invention. As mentioned previously, Fottinger teaches inserting 4 to 24 reinforcing threads per inch (warp direction) and 4 to 15 reinforcing threads per centimeter (weft direction). Fottinger does not teach or suggest a two-layered fabric with a low thermal shrinkage fiber backing scrim and a face to back yarn ratio range of 6:1 to 12:1.

As stated previously, the Applicant's recite fabric comprised of two different fibers with differing thermal shrinkage properties. The two fibers are interwoven in such a manner to prevent cracking and physical deterioration when the fabric is exposed to heat. Neither Fottinger nor Poisson teach or suggest such a fabric.

It is, therefore, respectfully submitted for at least the reasons stated above that Poisson fails to overcome the deficiencies of Fottinger. In view of this, it is respectfully submitted that claim 1 is patentable over Fottinger and Poisson. Withdrawal of the art rejections for claim 1 is therefore respectfully requested.

Claims 2-12 depend directly from independent claim 1 and are therefore respectfully submitted to be patentable over the art of record for at least the reasons set forth above with respect to the independent claim 1. Note that in regards to claim 12, the cited Smith, Jr. patent fails to overcome the deficiencies of the primary references. Withdrawal of the rejections of these claims is respectfully requested.

For at least the reasons stated above, withdrawal of all rejections under 35 U.S.C. 103 is respectfully requested.

CONCLUSION

In light of the foregoing, Applicants respectfully submit that all pending claims are allowable and respectfully request early Notice of Allowance from the Examiner. Should any unresolved issues remain, the Examiner is encouraged to contact the undersigned at the telephone number provided below. No fees appear to be necessary for this response. However, if the Assistant Commissioner determines that any fee is due, such fee may be charged to deposit account No. 50-0388 (Order No. UDL1P067).

Very truly yours,

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